INDEPENDENT BROADCAST CONSULTANTS, INC.
110 COUNTY RD. 146,
TRUMANSBURG, N.Y. 14886-9721
(607) 273-2970

February 28, 1994

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

in re: An Inquiry into the Commission's Policies and Rules regarding AM Radio Service Directional Antenna Performance Verification

MM Docket No. 93-177

Dear Mr. Caton:

On behalf of our company, we transmit herewith the original and four (4) copies of our Reply Comment in responce to the Commission;s Notice of Inquiry in the above-referenced matter. We understand the deadline for reply comments in this matter is March 1, 1994. Therefore, in view of the fact that this comment is being hand-delivered, we trust it will be regarded as timely filed.

We stand ready to answer any further questions which may arise in this matter and to address further stages of this proceeding.

Respectfully submitted,

William J. Sitzman, Jr.
President

Encl.

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REPLY COMMENT

in the matter of

An Inquiry into the Commission's
Policies and Rules Regarding AM
Radio Service Directional Antenna
Performance Verification

MM Docket No. 93-177

February 28, 1994

Submitted by:
William J. Sitzman, Jr.
President
Independent Broadcast Consultants, Inc.

Before the

FEDERAL COMMUNICATIONS COMMISSION

Washington, D.C.

In the matter of An Inquiry into the Commission's Policies and Rules regarding AM Radio Service Directional Antenna Performance Verification	MM Docket No. 93-177

To: The Commission

REPLY COMMENT

Independent Broadcast Consultants, Inc. ("IBC"), located at 110 County Road 146, Trumansburg, New York 14886-9721, respectfully submits the following reply comment in the Commission's inquiry into the policies and rules pertaining to the performance verification of directional antenna systems at AM broadcast stations, MM Docket No. 93-177. For the record, IBC offered its Formal Comment in this proceeding on August 19, 1993, and it directs the Commission and all interested parties to the full text of that submission for a complete discussion of the various issues this commenter believes deserve attention.

Since IBC's August 1993 Comment, however, several developments have occurred. Various parties, most notably a number of recognized broadcast engineering firms, have submitted their own comments on MM Docket 93-177. Also, on January 13, 1994, the National Association of Broadcasters (NAB) convened a Washington meeting of consulting engineers to address the docket and to allow an expression of various opinions. And finally, the alternative opinions have received extensive coverage in the industry press. Having lacked advance notification from the NAB, IBC found it impossible to attend the January seminar (though it would have welcomed the opportunity.) However, it has conferred with

other consulting engineers active in directional AM tuning and adjustment, including Mr. Ronald L. Rackley, one of those in attendance at the NAB seminar and among the leading advocates of reforming the current AM performance verification rules. Our office has read and analyzed the comments of Mr. Rackley's firm, du Treil, Lundin & Rackley, Inc.; and has also studied the arguments raised by others through press reports.[1/] Judging from information received to date, it appears those engineers taking the lead in this proceeding are those who advocate nothing short of radical reform in current standards for performance verification. Those speaking the loudest and quoted the most would replace what they regard as cumbersome, expensive and outmoded antenna proofs-of-performance with newly-developed computer modeling techniques, most notably the much-touted Method of Moments program. From an outsider's perspective, one might conclude the engineering community's support for radical change is unanimous. We offer these reply comments to document that it is not.

SUMMARY OF PREVIOUS COMMENTS:

In its August 1993 Comment, IBC urged Commission retention of current performance standards and procedures as a basic core requirement for the licensing of any new or modified directional AM antenna system. Indeed, with the Commission's renewed emphasis upon interference containment, we argued a well-documented ground-based antenna proof is more important than ever. We stand by that position. While antenna proofs may, at times, incur a financial burden upon the station operator, our firm maintains such is the price to be paid for holding an AM license. Limited station resources, a fact of life for most AM's in the '90's, should not justify a compromise in engineering standards. Intelligent modifications in current rules may be carefully studied. However, as stated previously, these modifications should be adopted only after it is proven they will enhance, not

1/ See: "Seminar Focuses on AM Directional Rules,' Radio World, Feb. 9, 1994; Also: "Attention, AM's!," by William Suffa, Radio Ink, Jan. 31 - Feb. 13, 1994.

compromise, previous Commission initiatives at interference reduction enacted with Docket 87-267.

Based upon our professional experience, no substitute yet exists for thorough, ground based field measurements, substantiated by maps, field tabulations, graph analysis and designated monitor points. A computer program, no matter how sophisticated, cannot consider all factors of the real environment in which the antenna system exists. While computer programs may serve as helpful tools, they cannot take the place of tried-and-true field documentation.

Our Comment also dealt with a variety of related issues. Most notably, we urged a tightening of current rules requiring more frequent human oversight of the antenna system, noting that at many AM stations today's operators lack either the knowledge or the motivation to take periodic monitor readings. We urge readoption of rules requiring the logging of antenna parameters at minimum frequency intervals. We also support a tightening of current practices which allow station abuse of Special Temporary Authorizations (STA's). Under present policy, delinquent operators can often request and secure an endless string of STA's instead of addressing the interference-causing problem which led the array of deviate from standard. We stand by these positions as well.

With these positions stated, IBC will proceed to address those comments raised by others or ascribed to them.

COMPUTER MODELING TECHNIQUES:

As stated, the undersigned has conferred with Mr. Ronald Rackley, one of the principal authors of the du Treil, Lundin & Rackley (dLR) Comment in this proceeding. We have also studied the dLR Comment itself. Mr. Rackley provided through our conversation valuable insight into the Method of Moments program in which he strongly believes. The program appears well conceived and

soundly based in theory. Should *all pertinent factors* be examined and the array exist on a flat, obstruction-free environment, the Method of Moments program offers the opportunity to serve as a valuable tool in antenna tuning. Based on our experience, the trial-and-error tuning procedure currently used consumes at least 50% of an antenna proof's time and expense. Therefore, a program like Method of Moments, applied intelligently, holds out the potential for considerable station savings. But this technological advance is available now without changing the rules. If the program works as well as its proponents claim, then documentation should be easily accomplished in a few days' time, while still providing all the information current rules require.

But engineering experts, including Mr. Rackley, acknowledge even Method of Moments has its limitations. The land on which the array stands must be perfectly flat, not rolling; the towers must be uniform cross-section, not tapered; sampling loops must exist at specific locations on the towers to allow program accuracy; folded unipole systems are inapplicable for modeling; and surrounding terrain must be devoid of major obstructions. Various other factors may hamper program accuracy. And as one well-respected directional system design engineer confided with the undersigned, the Method of Moments program will get you close to the desired numbers, but the array will still require fine tuning. That remark by itself should validate IBC's position that technology has not yet advanced to the point to which computer modeling can stand alone to verify compliance without supporting field data.

FIELD DOCUMENTATION ESSENTIAL:

Various participants in this proceeding have urged a significant relaxation in the documentation requirements for field measurements. Among the suggestions purportedly advanced at the NAB seminar were that field measurements be limited to ten points (DA and NDA) per radial and only then at critical azimuths; that monitor points be eliminated; and that measurement point maps

no longer be required with the submission of antenna proofs. Some proponents call for the elimination of conductivity graph analysis as well. IBC believes this relaxed documentation is unwise.

A well-maintained antenna system may continue for 20-40 years before a new full antenna proof is required. Continuity dictates that succeeding generations of engineers have access to necessary field data to whatever extent necessary. Should you require evidence, merely observe many of the skimpy antenna proofs that accompanied stations licensed in the late '40's and early '50's, an era when documentation was much less strict than it is now. True, landmarks change over time. But detailed documentation, particularly maps and field tabulations, allow future engineers valuable information on which to base intelligent decisions. And those who assert that the field measurement technique is frought with imperfections ranging from inaccurate distance computations to improperly calibrated field strength meters are simply trying to defend poor engineering practice. The Commission should not tolerate a "dumbing-down" of the engineering profession, nor should it use that excuse to relax current requirements.

Full and complete radial measurements, including walk-in measurements during the first two miles, stand as a key ingredient in ensuring a proper inverse field for the directional antenna system. A partial proof-style ten-point radial tells little, since analysis of only a smattering of points (without walk-ins) often fails to reveal whether differences arise through changes in inverse field or soil conductivity. While measurement at distances beyond 20 kilometers (12.4 mi) tell less about antenna condictions than close-ins and might be made optional by the Commission, intense close-in measurement should be retained. And the Commission should require for the sake of accuracy radial measurement at all pertinent azimuths, not just in minima or minor lobes.

MONITORING TECHNIQUES:

Various commenters, including dLR, have proposed to place increasing importance in the antenna system monitor as perhaps the sole determiner of antenna system compliance. IBC believes such a change would prove not only unwise, but dangerous from the standpoint of interference containment. At present, licensed arrays may be observed for possible trouble by means of the antenna monitor, the base current meters, and the monitor points in the field. Each system essentially cross-checks the other. Were the requirement for base current meters and monitor points to be eliminated, troubleshooting of antenna systems would become far more difficult, since the engineer could not instantly verify whether a monitor deviation was the result of transmission or sampling system failure. In our office's investigation of aging, neglected arrays, we observe more often than not that the array's problems lie in sampling, not transmission failure. Should the antenna monitor become the only available measurement tool, we can envision well-intentioned, yet ill-guided engineers cranking phasor controls supposedly to pull the pattern to licensed numbers, only to mis-tune the array and impose prohibited interference due to an unknown sampling system failure. The current cross-checking system works well. And from a practical standpoint, the retention of monitor points gives Commission field inspectors and engineers from other affected stations instant access to a system's performance.

dLR questions the validity of requiring licensed base current tolerances when such current meters often lose calibration with age or sustain lightning damage. dLR's point may be well taken. IBC believes base current meters should be retained. However, it would seem unfair for a Commission inspector to cite a station for a base current discrepancy when the both the antenna monitor and monitor points indicated pattern compliance. Therefore, we suggest the establishment of licensed base ratio limits be deleted, but that

a record of such values be made during the course of a full or partial antenna proof-of-performance.

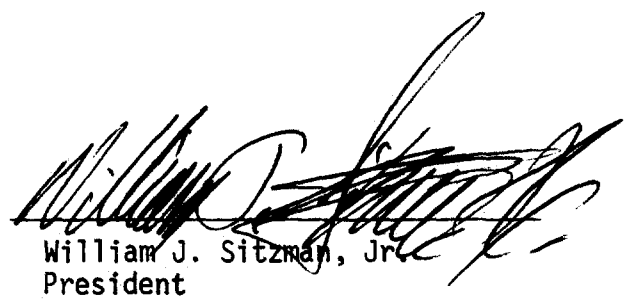
One of the issues raised in this proceeding concerns the continued need for critical array designation of certain antenna systems. In its initial Comment, IBC suggested significant relaxation of this provision, perhaps substituting more frequent antenna measurement for the currently-required sophisticated apparatus. And IBC agrees with those commenters who argue that the designation of critical array often serves as a tool for the affluent large market station to intimidate the smaller operator. Imposing additional financial burden upon those selected facilities designated as critical arrays would appear less important in today's environment than would uniform enforcement of one set of antenna standards upon all licensees. Therefore, IBC supports those who call for elimination of critical array requirements.

CONCLUSION:

The Commission's Notice of Inquiry in MM Docket 93-177 serves as a valuable opportunity for engineers and station operators to assess the current status of AM directional antenna performance review and to recommend appropriate reforms. IBC welcomes the opportunity. However, based upon comments reported to date, many participants appear to be suggesting the current regulations, developed and refined during the past half-century, are flawed and outdated. Moreover, many insist compliance with these rules simply costs stations too much money. Critics of the current practice would replace detailed documentation with computer guesswork. While IBC has no quarrel with computer modeling, it reminds the Commission that effective computer analysis is only as accurate as the data fed into it and the expertise of the engineer in charge. And with many antenna systems still possessing quirks making them inapplicable for computer modeling, IBC would oppose any effort to *mandate* computer modeling as a substitute for the traditional antenna proof. In own opinion, the whole system

isn't necessarily broken, and doesn't require fixing. True, many directional AM antenna systems are neglected, misadjusted, and hence illegal. And any effort by the Commission to encourage more widespread compliance at reduced cost will be appreciated. But economic expediency should not serve as justification for the relaxation of engineering standards, especially as the Commission seeks to expand its role in interference reduction. In our opinion, wise reassessment of present rules does no harm. But wholesale replacement of current antenna performance standards is neither necessary nor prudent. We trust the Commission agrees.

February 28, 1994



William J. Sitzman, Jr.
President
Independent Broadcast Consultants, Inc.
110 County Road 146
Trumansburg, N.Y. 14886-9721